

1999 Revised

RESOURCES MANAGEMENT PLAN

HAGERMAN FOSSIL BEDS NATIONAL MONUMENT, ID

HAFO Superintendent

Date

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I. INTRODUCTION

SIGNIFICANCE OF THE MONUMENT

Hagerman Fossil Beds National Monument (HAFO) is internationally significant for its diversity and quantity of paleontological specimens of the Pliocene Epoch. It is also one of three National Park Service (NPS) units that has ruts of the Oregon Trail. The park also preserves pre-history and historical settlement resources.

PURPOSE OF THE RESOURCE MANAGEMENT PLAN

This Resource Management Plan (RMP) is a revision of the one completed in 1995. Both were developed according to the NPS Resource Management Plan Guideline (March 1989), under the directives of NPS Management Policies (1988). The Plan is a long-range planning and budgetary document that defines park resource management objectives, presents long-range strategies, and delineates actions for implementing those strategies. It presents issues regardless of the expected time frame for problem resolution. Funding and staffing needed to address the issues are estimated. The intent is that carrying out the actions presented in this plan will lead to a comprehensive, coordinated program of resource stewardship.

This Plan describes the known natural and cultural resources of the Monument, documents and evaluates their current condition. It also establishes a historical record of management efforts and accomplishments, and the status of deficiencies in the inventory, study, and treatment of the Monument's natural and cultural resources. The Plan functions as a reference to guide resource management activities by Monument staff. It is also used by the Support, Regional and Washington offices to identify and track issues, and resulting actions. This plan is also a budgetary tool to obtain funding and staffing for resource management projects. It may serve as a source document for interpretive programs. The RMP is also a public document and may be obtained by members of the general public interested in the condition of, and proposed actions affecting, the Monument's resources. It is an agreement between the Superintendent and higher level management as to the priority resource problems and issues, and the strategy for dealing with them.

AUTHORITY AND MANDATES

Hagerman Fossil Beds National Monument is a component of the National Park System. Direction for managing resources comes from the Monument's enabling legislation, the National Park Service Organic Act, amendments to the Organic Act, and National Park Service management policies and guidelines.

On November 18, 1988, Hagerman Fossil Beds National Monument was "established by Congress in P.L. 100-696, The Arizona-Idaho Conservation Act of 1988, Sec. 301(a) to:

- (1) preserve for the benefit and enjoyment of present and future generations the outstanding paleontological sites known as the Hagerman Valley fossil sites,
- (2) to provide a center for continuing paleontological research, and
- (3) to provide for the display and interpretation of the scientific specimens uncovered at such sites..."

This legislation further states in Sec. 306:

"In order to provide for continuing paleontological research, the Secretary shall incorporate in the general management plan provisions for the orderly and regulated use of and research in the

Monument by qualified scientists, scientific groups, and students under the jurisdiction of such qualified individuals and groups."

Subsequently, legislation passed by Congress on November 5, 1990, permits hunting and fishing on monument lands within an area 50-ft in elevation above the high water level of the Snake River (P.L. 101-512). Included in this legislation is permission to maintain structures necessary to undertake such hunting and fishing activities.

On February 2, 1969, the State legislature established a 492 acre State Park in the state-owned section, which contains the Hagerman Fossil Horse Quarry. On October 4, 1990 this state park was deleted from the list of Idaho State Parks. The state retains ownership of the section, which is currently being managed by Hagerman Fossil Beds National Monument under a Cooperative Agreement with the Idaho Department of Parks and Recreation. The NPS is actively seeking acquisition of that Quarry.

Hagerman Fossil Beds National Monument is to be managed in accordance with the fundamental purpose of all units of the National Park System, which is:

"... to conserve the scenery and the natural and historic objects and the wild life therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." [16 USC 1a-1]

Further, the 1978 amendments to the Organic Act state:

"The protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established..." [16 USC 1a-1]

Additional Legislation

The American Antiquities Act of 1906 establishes the foundation for protection of paleontological and cultural resources on federal lands. This act was created to protect any historic or prehistoric ruin or monument, or any object of antiquity situated on lands owned or controlled by the Government of the United States from appropriation, excavation, injury or destruction without the permission of the Secretary of the Department of the Government having jurisdiction over the lands where antiquities are situated. Permission is granted through a permit process to examine ruins, excavate archeological sites, and gather objects of antiquity to institutions which are deemed properly qualified to conduct such examination, excavation, or gathering, subject to prescribed rules and regulations; "provided that the examinations, excavations, and gatherings are undertaken for the benefit of reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums."

The National Environmental Policy Act of 1969 (NEPA) was created "to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment..."

The National Historic Preservation Act of 1966, as amended, established a federal program for preservation of historic properties. Section 110 requires all federal agencies to identify, evaluate, nominate and protect cultural resources within their jurisdiction. Section 112 requires that these resources be managed by professionals that meet the Secretary of the Interior's standards. There are remains of historic structures within the boundaries of HAFO that are proposed for survey and documentation; a determination of eligibility is needed for the National Register of Historic Places. Also, the site acquired for the proposed

Museum/Research Center includes a farmstead with a historic building that will be managed according to an agreement with the State Historic Preservation Office. Additional cultural resources within the boundaries include segments of the Oregon Trail and archeological sites including a prehistoric fishery. The Archeological Resources Protection Act of 1979 was enacted to provide protection for historic and archeological resources on Federal lands.

Management Policies

The NPS Management Policies establish Servicewide standards for management, including activities, which affect natural and cultural resources. These are further elaborated upon by guidelines such as NPS-28 Cultural Resources Guideline, NPS-77 Natural Resources Guideline, and NPS-75 Natural Resource Inventory and Monitoring Guideline.

The General Management Plan and Environmental Impact Statement (GMP/EIS) presents a long-term plan for the general management of the Monument and was approved in 1996. It includes of the Monument's purpose and significance, management objectives, desired future conditions, management zoning, and interpretive themes. This Resource Management Plan is considered an appendix to the GMP/EIS, detailing management activities specifically related to the Monument's resources.

DESCRIPTION OF THE RESOURCES

Background

Hagerman Fossil Beds National Monument is located in south central Idaho on the western escarpment of Hagerman Valley. Hagerman Valley lies within the central Snake River Plain region of the eastern portion of the Columbia Plateau physiographic province. The Snake River flows west, then north, through this valley and scribes the eastern boundary of the Monument, a shoreline distance of approximately 7 miles. The entire length of the Snake River through the Monument is part of the Lower Salmon Falls Reservoir, the dam for which is located a short distance downstream from the monument. Another dam, the Upper Salmon Falls, is about 12 miles upstream from the Monument.

West of the Snake River, where the Monument is located, bluffs rise approximately 600 feet above the river. Much of this steep terrain is of badlands-type topography characterized by ridges, canyons, landslide scarps, and some flats. The bluffs are composed primarily of poorly consolidated, 3 to 4 million year old flood plain and stream deposits, volcanic ash and thin basalt flows that extend further northwest. Hagerman Valley formed about 15,000 years ago where the Bonneville Flood eroded between these sedimentary deposits and the basalt bedrock to the east. Vegetative cover is sparse, except around seeps and their intermittent streams, and is characterized by sagebrush steppe vegetation. Half a dozen landslides have occurred within the area of the Monument since the late 1970s, causing removal of vegetation, destruction of stratigraphy and paleontological sites, and steepening some portions of the bluffs.

The western boundary of the Monument generally follows the crest of the bluffs. The plateau beyond the western boundary has been used as farmland since the 1970s, primarily for growing sugar beets, potatoes, winter wheat, and corn. The Monument consists of 4,350 acres, including 420 acres of currently State-owned land, and is 7 miles long and 2 miles wide at its widest reach. Average width is approximately 1 mile. The Monument can be accessed by boat across the Reservoir, or by land 5 miles southwest of the town of Hagerman. The Bell Rapids project road provides public vehicular access through the southern end of the Monument. Graveled farm roads access the northern end of the Monument.

A basalt cliff forms the eastern rim of the Hagerman Valley. The eastern rim averages 400 ft in elevation above the Snake River (2,800 ft above sea level) and is characterized by resistant basalt cliffs. A gently sloping bench two to four miles wide, stretches from the base of the cliff to the river. A site on the east side of the Snake River immediately north of the Bell Rapids boat dock with commanding a view of the bluffs has been purchased for the planned construction of a Research Center and Museum. Visitors currently contact Monument staff at the temporary visitor center or administrative office located in Hagerman. Scheduled tours are offered during the summer months to the public, and for education during the other periods.

Visitation records were initiated in April 1991. Visitation increased approximately five-fold between the first and second year. Current usage is about 15,000 visitors each year. This is relatively high considering there are no directional signs yet in place. Signage needs will be evaluated in FY2000. There is presently only limited opportunity to provide interpretive programs for visitor participation until permanent facilities are obtained.

Visitor access to the west side of the river is restricted to protect the fossil resources and because of danger from potential recurrent landslides. Access is provided by accompaniment of a Park Ranger. It is expected that with future development of a research center/museum on the east side of the river, there will be additional means of facilitating visitor access to the west side.

Climate

The Hagerman Valley lies in an arid environment. The closest official weather-recording station is located in the town of Bliss, 9 miles north of the city of Hagerman. Bliss is located at 3,265-ft elevation, just outside of the Hagerman Valley. In Bliss, the mean annual temperature is 50oF. The average high temperature in July is 91oF, and the average low temperature in January is 19oF. Average annual precipitation at Bliss is 9.6 inches, which falls primarily during the winter and spring months. Snowfall in the Hagerman Valley is light. Prevailing winds are from the west and have a drying effect. The growing season in Hagerman Valley is 140 days long.

Ambient air quality in the Hagerman Valley is very clean. A notable exception is the blowing dust, which can occur, particularly during springtime when much of the farmland on the plateau to the west has been planted. During this time, dust storms may occur. Some agricultural burning also occurs in the spring and fall. Air pollution from industrial sources and vehicles is minimal. Ambient air quality is not monitored in Hagerman Valley. Hagerman Fossil Beds is designated as a Class II area under the 1977 Clean Air Act Amendments. As such, a limited amount of deterioration in air quality is permitted, as long as the National Ambient Air Quality Standards are not exceeded.

Geology

As the Snake River flows through the Hagerman Valley it cuts between nearly horizontal sedimentary deposits geologically called the Glenn's Ferry Formation, a part of the Idaho Group, and basalt bedrock that is part of the Snake River Group. The Hagerman Valley lies near the eastern extremity of the Glenn's Ferry Formation, a complex assemblage of flood plain and stream deposits associated with ancient Lake Idaho, interbedded with local, discontinuous lava flows, which extends over several thousand square miles of the western part of the Snake River Plain. The high bluffs of the west side of the valley are part of this formation of poorly consolidated sediments and minor lava flows of basalt or volcanic ash. The sediments are characterized by abrupt facies changes in massive layers of silt, thick layers of sand and occasional sandstone, and thinly bedded clay. The Fossils are buried within these sediments. The plateau area on top of the bluff is underlain with permeable gravel interbedded with sand and silt and is known as the Tuana Gravel. A

continuous layer of caliche several feet thick is buried three to four feet below the surface within the Tuana Gravel. It functions as a caprock on the top of the bluffs and as a significant barrier to ground water infiltration where it is unbroken. Younger sedimentary formations and alluvial deposits are also found along the bluffs.

Extensive basalt flows of various ages to the east and north of Hagerman Valley cover a more vast area of the Snake River Plain than do the sediments. These flows are younger than the Glenn's Ferry Formation (GFF) and can be seen to cover the GFF in outcrops along Billingsly Creek. Five separate basalt flows form the cliffs on the east side of the valley. From the geology of the valley, a generalization can be made that valley walls and land to the east of the Snake are primarily igneous in nature (the Snake River Group), while strata to the west is primarily sedimentary (the Idaho Group). Surficial deposits can be found along both valley sides in several locations.

The valley floor consists of varying geological features. The Miocene Banbury Basalt forms the rapids at Upper and Lower Salmon Falls and probably Bell Rapids, now submerged by the reservoir. The Sand Springs Basalt, which erupted from Flat Top Butte just north of Twin Falls, forms the main floor of the valley. Parts of the valley floor are covered by surficial deposits distributed by the Snake River and are dominated by the Melon Gravel deposited during the Lake Bonneville flood.

History

The prehistoric and protohistoric use of the Snake River corridor by native American peoples stretches back thousands of years. Hunting, gathering, fishing and spiritual sites, permanent and temporary settlements, and trails are all part of the prehistoric record within this corridor. Within the historic period, there are sites related to emigration along the Oregon Trail, early mining and settlement activities, and 20th century hydropower and irrigation enterprises.

Interest in the fossils of Hagerman Valley began in the 1920's when a local rancher named Elmer Cook showed some fossil bones to Dr. H. T. Stearns of the United States Geological Survey, who, in turn, brought these to the attention of Dr. J. W. Gidley of the Smithsonian Institution. Gidley is credited with identifying the fossil bones as belonging to a horse, and subsequently led collecting expeditions to the site in 1929 and 1930. The third Smithsonian expedition was in 1931 and the fourth in 1934. During the 1950s and 1960s scientists from the University of Utah, University of Michigan, the Natural History Museum of Los Angeles County, Idaho Museum of Natural History, and Pacific Union College conducted paleontological field studies at the Hagerman fauna sites. Many of these expeditions were also for the purpose of identifying and collecting fossil specimens. The United States Geological Survey has also studied the stratigraphy, geomorphology and geologic history of this area. Knowledge of the fossil mollusks (freshwater bivalves and snails) at Hagerman is through work done by the USGS. The Hagerman fossil locality has an international reputation among mammalian vertebrate paleontologists as a classic example of late Pliocene Blancan fauna. Approximately 130 different species of animals have been found and over 25 paleontologists have written nearly 100 reports describing these new vertebrate specimens (Akersten & Thompson, 1992; McDonald, pers. comm. 1993; NPS 741, 1974).

Contemporary paleontologists are broadening their perspective of past life on earth by studying the relationship of different fossil species within a deposit to one another and their stratigraphic/depositional setting. Among current research topics directly applicable to Hagerman are studies of paleobiodiversity and community and ecological response to environmental change. The variety of biological materials; vertebrate, invertebrate and botanical, preserved at Hagerman permits critical evaluation of long-term climatic trends and community response to environmental changes.

Human Activities

The reservoir behind Lower Salmon Falls dam is classified as a navigable water and is a popular boating and fishing area. A public boat ramp and recreational area exists on State land immediately south of the Museum/Research Center site.

As previously noted, hunting within 50 feet in elevation above high water of the Snake River was authorized by Congress, consisting primarily of waterfowl hunting.

Hydrology

Surface hydrology is dominated by the Snake River. The Snake River enters the Hagerman area at an elevation of 2,888 ft, with an average flow of 5,000 ft³/sec near the Upper Salmon Falls dam. The entire length of the river through the Monument is part of the Lower Salmon Falls Reservoir. Spillover elevation at the dam is 2,797 ft. The water level is kept relatively constant above the dam, with a fluctuation of about 1-ft. throughout the year.

East of the river is the Hagerman Bench, which is crossed by irrigation ditches with little natural runoff. The only major natural drainages into the river are spring-fed Riley Creek and Billingsley Creek. Irrigation ditches channelize most of the remaining surface runoff and water from the many springs along the basalt cliffs to the east, and carry it through canals to the river. A few small man-made lakes and ponds exist back from the river. Numerous lakes, ponds, and swampy areas occur at the southern end of the bench.

Drainage from the west consists of steep washes on the sedimentary bluffs. Prior to development for irrigation, the natural contour of land on the plateau dispersed runoff from precipitation into many small, ephemeral tributaries that flowed over the canyon rim to the Snake River. Subsequent development of farmlands and construction of roads have altered the natural contours of the land, and runoff from precipitation and irrigation water applied in excess of crop and soil moisture requirements is now concentrated in fewer but larger tributaries. Consequently, some tributaries carry more water and locally amplifies the potential for erosion from surface-water runoff (Young, 1984). The largest flows probably occur shortly after an intense rainstorm or rapid snowmelt or when irrigation sprinkler systems are flushed. Two drainages dominate the bluffs. One is Fossil Gulch, which cuts through important fossil beds. Natural drainage in the Fossil Gulch area is disturbed by a service road and pipeline. The second, and larger one, is Peters Gulch, which also dissects several fossil beds before entering the river.

The best-known feature of the Hagerman Valley is the many springs that flow from the basalt cliffs on the east side of the valley. The most spectacular of these is Thousand Springs, south of the Hagerman Bench. These springs are the outflow from a giant aquifer underlying the Snake River Plain, which has been breached by the canyon cut by the Snake River. This aquifer is one of the largest hydrologic systems in the world. Flow from the aquifer at the springs averaged 5,900 ft³/sec from 1910 to 1966. The discharge is so great that, during the dry summer season, much of the flow of the Snake River is derived from the springs. As irrigation withdrawal from wells on the Snake River Plain increases, it is expected that the flow from the springs may decline.

In a detailed ground-water study conducted by Moffat and Jones (1984) three aquifer systems were identified in the Bruneau Plateau: (1) a perched aquifer, (2) a regional aquifer, and (3) a deep thermal-water aquifer. The regional aquifer is about 500 to 700 feet below the land surface. Water level contours from well data show ground-water flow to be generally towards the north with local diversion eastward toward the Snake River.

Moffat and Jones (1984) and Young (1984) were the first to document the presence of a perched aquifer. Present knowledge of this aquifer is based on data from 11 monitoring wells, seeps, canal seepage loss measurements, the stratigraphy of the Glenn's Ferry Formation and mesic vegetation growing on wet areas, seeps and landslides along the bluffs. The 1974 Draft Environmental Statement for the proposed Monument stated that there were no springs along the bluffs west of the river. These changes came about after the development of farmlands on the plateau and the construction of two unlined irrigation canals supplied with water pumped from the Snake River. The enabling legislation specifically stated that these pipelines, one in Fossil Gulch, as well as another one near the Bell Rapids site since destroyed by a landslide, are consistent with the purposes of the Monument.

Stratigraphic variations within the Glens Ferry Formation indicate that there are several perched aquifers. Stream deposits within this formation and local basalt flows function as aquifers interspersed with the more impermeable floodplain facies. Water movement is facilitated by coarser river sands which tend to be more permeable and water is funneled to these sands by the more impermeable overbank deposits of silts and clays. The canals penetrate the relatively impermeable caliche layer, allowing seepage from the canals to recharge the shallow perched aquifer. The dynamics of these processes was the subject of a Masters thesis (Farmer, C. Neal, 1999). Since about 1979 six large landslides have occurred within the present boundaries of Hagerman Fossil Beds National Monument and future landslides continue to be a serious threat not only to the paleontological resources of the monument, but to human safety and property as well.

Water quality from springs flowing from the Snake River Plain aquifer is excellent due to the geological characteristics of the aquifer. Because igneous rocks do not contain readily soluble materials, the water is low in total dissolved solids. Chemical analyses from various springs along the river indicate that dissolved solids average about 260 mg/l (Thomas, 1969:37). Water from the springs maintains a constant temperature of 58°F.

Although no quantitative analyses are readily available, the water quality in the Snake River flowing through the Hagerman Valley is likely degraded by drainage from agricultural lands, industrial wastes, and human wastes upstream.

Paleontological Resources

The Hagerman fossil beds are located in fluvial and floodplain deposits along the eastern margin of the Glens Ferry Formation. More than 500 fossil sites have been documented over a six-square mile area at different horizons within these sediments. Many fossil exposures have occurred in areas of ablation, where the wind has eroded the protective sedimentary cover. But the most well known discovery has been the Smithsonian Institution Horse Quarry, the largest single deposit of an extinct species of zebra-like horse ever found. Also preserved within the sediments is one of the most prolific and diverse deposits of Pliocene animals. Over 100 species of vertebrates, including 18 fish, 4 amphibians, 9 reptiles, 27 birds and 50 mammals have currently been identified, as well as freshwater snails and clams, and plant pollen.

Present in the Monument are carbonaceous paper shales with high amounts of plant debris that represent pond deposits. As of yet there have been no studies on these shales with regard to the macrobotanical material. Study of plants from these deposits should yield important information on the vegetation associated with pond environments. These shales also have the potential to produce insects.

Although not perfectly preserved, a log was discovered buried in the strata. Isotope studies on this wood should yield important data with regard to water associated with the living tree and related environmental and climatic information.

Quiet

Natural quiet was identified in the GMP as one of the Monument's attributes. Present noise levels in the valley and city of Hagerman are not a subject of concern to local residents. Most noise results from vehicle traffic. Statistics in 1973 showed that truck traffic made up approximately 10 percent of the traffic flow through Hagerman. Motorboats and jet skis on the river are the source of very localized noise. There are no airstrips or railroads in the valley. These issues may require monitoring.

Soils

Most of the land within the Monument is on steep slope. Soils found here are classified as shallow to very shallow. Their available water-holding capacity is very low.

Soils on top of the plateau are deep to moderately deep and well drained. These soils extend down 20 to 40 inches to the durpan (locally called caliche). Soils of this nature are silt loam with a strongly calcareous layer beginning about 8 or 9 inches deep. Subsoil permeability is moderate with moderate to high available porosity.

Vegetation

The Monument consists predominantly of the sagebrush steppe communities common to much of south central Idaho. The steep slope of the bluffs west of the river provide an environment that contributes to the diversity of plant species. A riparian zone and local areas of marshland occur along the Reservoir. Wetlands exist along both Billingsley and Riley creeks.

Flora on the upland plateau was once a vast complex of Wyoming big sagebrush (*Artemisia tridentata*) association. Most of this vegetation has been replaced by agricultural crops. Some of the Monument's west boundary areas were cleared and now support common rabbitbrush (*Chrysothamnus nauseosus*), and introduced grasses and weeds.

Vegetation on the slopes is sparse in many areas due to aspect and the steepness. Greasewood (*Sarcobatus vermiculatus*) and rabbitbrush occur on more alkaline soils. Scattered four-wing saltbush (*Atriplex canescens*) occurs on more calcareous soils. Grasses are dominated by the non-native cheatgrass (*Bromus tectorum*). A listing of common forbe species is given in the Appendix. Russian thistle (*Salsoa kali*) predominates on disturbed sites.

Riparian vegetation includes black cottonwood (*Populus trichocarpa*), bullrush (*Scirpus spp.*), and cattails (*Typha spp.*). Willows (*Salix spp.*) are most common in the vicinity of the dam and the falls to the north and south of the Monument. There are locally dense stands of the invasive Russian olive (*Eleagnus angustifolia*) along the shore, and purple loosestrife (*Lythrum salicaria*) and saltcedar (*Tamarix spp.*) is invading. Other aquatic vegetation includes coontail (*Ceratophyllum demersum*), duckweed (*Lemna spp.*), watercress (*Rorippa nasturtium-aquaticum*), and pondweed (*Potamogeton spp.*). Algal mats are common in warm weather.

The Monument is also important to microbiotic plants, usually forming a soil crust or found on aging brush or rocks. A USGS-BRD botanist indicated that the exclusion of grazing makes portions of the Monument significant as a botanical preserve.

The Idaho Conservation Data Center lists the following plant species of concern in the Monument and their sites need protection:

Giant helleborine	<i>Epipactis gigantea</i>
Packard's cowpie buckwheat	<i>Eriogonum shockley var. packardiae</i>
Owyhee mourning milkvetch	<i>Astragalus atratus var. onyheensis</i>

Mourning milkvetch, *Astragalus atratus var. insepitus* (C1*), may be present and needs verification. Torrey's blazing star, *Mentzelia terreyi var. acerosa*, is no longer State listed but may require protection considerations.

Wildlife

Agricultural and residential development, as well as recreational activity, have altered the wildlife community of the Monument. Deer (*Odocoileus hemionus*) are present. The most visible species, when its population is high, is the black-trail jackrabbit. Cottontail and pygmy rabbits are also present. Other species include Townsend's and Richardson's ground squirrels (*Spermophilus spp.*), canyon mouse (*Peromyscus spp.*), wood rats (*Neotoma spp.*), marmots or rockchucks (*Marmota flaviventris*), and kangaroo rats (*Dipodomys ordii*). Predators include coyotes (*Canis latrans*), badgers (*Taxidea taxus*), spotted skunks (*Spilogale putorius*), striped skunks (*Mephitis mephitis*), weasels and mink (*Mustela spp.*), and an occasional bobcat (*Lynx rufus*).

One of the most abundant bird species is the non-native pheasant (*Phasianus colchicus*). Adjoining agricultural lands provide nesting and brooding cover, while the river breaks are used for escape and winter cover. Modest populations of exotic gray partridge (*Perdix perdix*) and chukar partridge (*Alectoris chukar*) occur in the area, with their populations depending on annual nesting success. Valley quail (*Callipepla californica*) are also common.

Waterfowl species are dominated by seasonal migrations. The state fish hatchery and game preserve in the Riley Creek marsh area serve as a resting area for migratory birds. Along with other species of dabbling and diving ducks, as many as 10,000 ducks may be present at a given time.

Golden eagles (*Aquila chrysaetos*) are seen during the winter season. The Idaho Power Company has completed some limited bird surveys in the Monument in preparation for their request of relicensing for the hydropower operations.

Here and along the Snake River, several species of waterfowl and other bird species are found. Fish abound in the small impoundments and the Snake River, while small mammals are plentiful in the sparse desert vegetation as well as in the riparian and phreatophyte habitats.

In 1991, the Nongame and Endangered Wildlife Program of the Idaho Department of Fish and Game (IDFG) published a booklet "Idaho Bird Distribution: Mapping by Latilong," which contains wintering and breeding range information for bird species. In 1992, IDFG and the Cooperative Fish and Wildlife Research Unit of the University of Idaho published an atlas of GIS-produced maps of terrestrial Idaho vertebrates.

The aquatic ecosystem is inextricably linked, through the riparian zone, with the terrestrial ecosystem. Species of fish in this stretch of the Snake River include rainbow trout (*Salmo gairdneri*), small-mouth bass (*Micropterus dolomieu*), chub (*Couesius plumbeus*), suckers (*Catostomus spp.*), and non-native carp (*Cyprinus carpio*). Sturgeon (*Acipenser transmontanus*), although once plentiful, are now rare.

Several stocks of Snake River salmon have been listed as threatened or endangered species. One landslide that occurred in 1993, upstream from the Monument, completely blocked the flow of the Snake River for a period of time. There is similar potential for landslides in the monument to impact habitats through which runs of threatened salmon pass.

Species of reptiles, amphibians, insects, and other invertebrates have not been extensively inventoried.

MANAGEMENT GOALS

The goals of management at Hagerman Fossil Beds National Monument are to preserve the natural and cultural resources within the monument, especially the paleontological resources - the fossils and geological integrity of the deposits in which they are located; and to provide for continuing paleontological research and the display and interpretation of recovered specimens.

NATURAL RESOURCES

Through an interdisciplinary scoping meeting in the fall of 1992, goals for natural resources were defined, along with associated strategies for each. These were developed into project statements and refined in this revision. These broad objectives, which are based on the fundamental purposes of the Monument, will change little over time. The strategies, though intended to be long-term, may change in response to changing conditions. The RMP's project statements are considered a plan of action for implementing these strategies.

Goals: Paleontological Resources

1 Identify and document paleontological resources, sites, and their geological setting, and protect from unnaturally accelerated erosion and other unnatural disturbance.

Strategy: Historical documentation has been obtained for paleontological research that has been conducted in the Monument. Establish coordinates and map new and historical paleontological sites. Evaluate the likely existence and scientific importance of paleontological resources remaining at each site. Inventory and monitor landscape and changes. Manage access to paleontological sites and salvage at-risk paleontological resources.

2 Encourage, facilitate, and manage paleontological research.

Strategy: Develop and manage a comprehensive paleontological research program as mandated in the Monument's enabling legislation. The strategy for carrying out this mandate shall encourage, facilitate, and manage all aspects of research. The research program must consider both NPS conducted and applied research activities to support resource management and planning activities, as well as pure scientific and academic approaches. Cooperative and partnership efforts to conduct research will be a critical element of this program. A specific strategy to implement this program will be developed as a component to strategic planning efforts over the next three years. Publicize research opportunities, and develop criteria for evaluating research proposals. Provide support services and facilities for researchers. Develop endowment to underwrite research efforts. Host scientific conferences. Establish cooperative relationships with other parks, other agencies, and institutions, whereby HAFO will contribute to overall advancement of the paleontological and geological knowledge, which forms the context for HAFO's resources. Library services will be provided to support research and interpretive activities.

3 Provide for public appreciation and understanding of the science of paleontology and enjoyment of fossil resources in such a way that they are protected for research use.

Strategy: Develop broadly based interpretive and educational programs to convey understanding and appreciation of fossil resources, the knowledge that can be gained from them at HAFO, the science of paleontology, and the Monument's resource management programs.

Goals: Non-paleontological Natural Resources

1 Re-establish native plant communities and associated ecological processes, such as disturbance regimes and soil processes.

Strategy: Document existing and historical vegetation. Develop vegetation goals and a management plan to accomplish them.

2 Perpetuate natural diversity, abundance, and behavior of native wildlife species.

Strategy: Inventory existing and extirpated species. Coordinate with other agencies, companies, and other interested parties in acquiring information and meeting mutual goals. Identify species of special concern, and define patterns and locations of habitat use.

3 Identify and mitigate impacts to Monument resources by external activities.

Strategy: Evaluate the influence of external activities on park resources. Develop understanding of impacts and their mitigation, including their effects on the community. Implement mitigating measures where appropriate. Assess the social, economic, and ecological effects of the Monument on adjacent landowners and communities.

4 Control the spread of non-native species and, where feasible, remove them from areas where they are already established.

Strategy: Inventory and map vegetation species. Apply IPM techniques to control and manage non-native species. Coordinate closely with counties and other agencies in management of non-native species.

CULTURAL RESOURCES

To date, only limited, preliminary surveys of the Monument's cultural resources have been conducted, primarily to comply with the requirements of Section 106 of the National Historic Preservation Act.

Little is known of the prehistoric or historic resources that lie within the Monument's boundaries. Prehistoric fishing sites were identified in a surface survey by Idaho Power Company. Segments of the Oregon Trail have been identified and mapped; other sites, structures, and landscapes remain to be surveyed and documented.

Collections related to the paleontological resources have been established and will be a primary focus of the Monument's resource management efforts.

The project statements in this plan focus on meeting the requirements of Section 110 of the National Historic Preservation Act to identify, document, evaluate, and protect the cultural resources within the Monument's

boundaries. As baseline data on the monument's resources are obtained, subsequent revisions of this resource management plan will address specific plans, special studies, staff and/or funding required to support the management of these resources. All data collected will be integrated into existing Servicewide databases and the park's GIS.

Scoping process: Discussions among the park staff and the cultural resource professionals in the Support Office comprised the primary scoping process for the cultural resource section of this document. Staff from the State Historic Preservation Office and the NPS Denver Service Center have also made contributions through their research and/or comments on the GMP and during the Research/Visitor Center planning process. The majority of project statements were prepared by the SO staff in consultation with the park. Because of the relatively limited information that currently exists on the Monument's cultural resources, these project statements were conceived to provide general direction for baseline studies as the first phase of the cultural resource program.

Goals:

- 1 Identify, evaluate, nominate and manage cultural resources within the boundaries of HAFO in accordance with federal and state laws and regulations and NPS policies.

Strategy: Conduct inventories of all historic property types that fall within the present or proposed boundaries of the reserve. Evaluate these properties within national and regional contexts and the eligibility criteria for the National Register of Historic Places. In consultation with the Idaho State Historic Preservation Officer, nominate eligible properties to the National Register. Develop specific management strategies for significant cultural resources.

- 1.1. Archeological Resources: Identify and document archaeological resources, sites, and their setting, and protect them from unnaturally accelerated erosion and other disturbances.

Strategy: Locate and obtain all historical documentation of archaeological research that has been conducted within or in the vicinity of the monument. Establish variety of cultural assemblages present within the monument and identify the span of time represented by these assemblages. Establish coordinates and map new and historical archaeological sites or individual artifact finds. Evaluate the likely existence and scientific importance of archaeological resources remaining at each site. Inventory and monitor landscape changes that would affect archeological resources. Manage access to archaeological sites and salvage and document at-risk archaeological resources.

- 1.2. Historical Resources: Identify and document historical resources, sites, and their setting and protect them from unnaturally accelerated erosion and other disturbances.

Strategy: Locate and obtain all historical documentation from historical research that has been conducted within or in the vicinity of the Monument. Establish coordinates and map new and historically known sites or individual artifact finds. Evaluate the likely existence and historical importance of historical resources remaining at each site. Inventory and monitor landscape and changes. Manage access to historical sites and salvage and document at risk historical resources.

- 1.3. Encourage, facilitate, and manage archaeological research.

Strategy: Develop guidelines for 1.3. Encourage, facilitate, and manage archaeological research. research within the monument as mandated in NPS-28. The strategy for carrying out these guidelines shall encourage, facilitate and manage all aspects of any archaeological research conducted on the Monument. The guidelines must consider both NPS and non-NPS conducted research activities to support resource management and

planning activities, as well as pure scientific and academic approaches. Cooperative and partnership efforts to conduct archaeological research will be a critical element of these guidelines.

1.4 Properly document and manage archeological collections to ensure long-term conservation and research use.

Strategy: Ensure the proper cataloging, treatment, and storage of archaeological specimens. This is defined by the NPS Museum Handbook and outlined in the Monument's Scope of Collections and Collections Management Plan. Provide museum services such as loan of specimens and retrieval of specimens for on-site research.

2 Identify potential impacts on cultural resources.

Strategy: Identify sources of potential impacts on cultural properties such as human activities (irrigation, hunting, visitor impacts) and natural forces (flooding, erosion, earthquakes) and develop both long-term management strategies and emergency response procedures to deal with these impacts.

3 Work with partners within the NPS and the local and regional communities to develop coordinated approaches to interpreting the area's cultural heritage and protecting cultural properties.

Strategy: Continue to foster CRM knowledge and skills through training and recruitment among HAFO staff. Identify professional resources within NPS (including the SO and other areas with significant paleontological resources) to support HAFO cultural resource management activities. Work with the local and state historical societies, state and regional educational institutions, to identify cooperative ventures to support the identification interpretation and protection of cultural resources.

4 Continue to develop a working consultative relationship with Native American groups whose heritage and contemporary interests include resources within HAFO.

Strategy: Identify Native American groups with specific interests in the resources managed by HAFO through ethnographic research. Initiate and/or maintain established contacts with representatives of these groups.

5 Establish a Park Archives to preserve the administrative record of HAFO; prepare an Administrative History of HAFO.

Strategy: Identify locations of all archival material and collect as appropriate, material for inclusion in park archives. Organize records in a coherent and easily retrievable manner for use by park staff and outside researchers. Prepare a detailed inventory and finding aid for the records, and incorporate archives into park collection. Microfiche archives and distribute duplicate sets as appropriate. Determine appropriate location for original records for long-term storage. Establish an on-going program to add administrative records to the park archives for long-term preservation information.

INTEGRATED RESOURCES

The interrelationship of natural and cultural resources at HAFO is provided by the following integrated resource management goals.

1 Properly document and manage paleontological collections to ensure long-term conservation and research use.

Strategy: Ensure the proper cataloging, treatment and storage of specimens. This is defined by the NPS Museum Handbook and outlined in the Monument's Scope of Collections and Collection Management Plan. Provide museum services such as loan of specimens and retrieval of specimens for on-site research, and explore long-term loans as well as exchanges.

2 Provide a center for paleontological research, resource management, and public enjoyment.

Strategy: Define needs, and design and construct a research and museum facility that supports research, collections management, and interpretation which harmonizes with and support conservation of resources at the site.

3 Manage all Monument uses and design access, facilities and other developments to minimize impacts on resources and ecological processes.

Strategy: Conduct detailed inventories of resources, as well as ecological processes such as wildlife movements and subsurface hydrology, in areas used or proposed for development of new activities. Monitor effects of recreational use, as well as non-recreational uses such as transmission corridors and irrigation systems, and ensure that appropriate cooperative documents are in place. Document encroachments and their effects, and develop an approach to resolve them.

II. PRESENT STATUS OF RESOURCES

NATURAL RESOURCE BASELINE INFORMATION

Very little quantitative information exists on the natural resources of the Monument. Species lists developed to date are shown in the appendices to this plan. A list of references on scientific information relevant to the resources also is appended.

The NPS-75 Natural Resource Inventory and Monitoring Guideline defines three phases in a monitoring program:

I • Inventory: Evaluation of historical data, development of conceptual models, and collection of initial resource data sets.

II • Monitoring: Design and implementation of long-term monitoring programs.

III • Integration: Analysis and synthesis of inventory and monitoring data.

Parameters for natural resource inventory and monitoring, suggested in NPS-75, are:

Geophysical and Chemical

A. Geology

1. Geological maps (bedrock and surficial) at reconnaissance level
2. Special-purpose maps showing:
 - a. Geologic hazards

- b. Channels and channel characteristics
 - c. Soils
 - d. Other special-purpose maps
- 3. Physical geology, mineralogy, and soils
 - a. Soil analyses
 - b. Principal mineral composition of geological units
 - c. Geo-hazards

B. Hydrology

- 1. Watershed delineation
- 2. Special-purpose maps
 - a. Ground-water
 - b. Bathymetry
 - c. Other
- 3. Location and classification
 - a. Streams
 - b. Lakes
 - c. Wetlands
 - d. Groundwater/springs
- 4. Physical parameters
 - a. Temperature (maximum/minimum)
 - b. Turbidity
 - c. Discharge
 - d. Sediment transport

C. Meteorology

D. Water chemistry

E. Aquatic bio-monitoring

F. Air quality

- 1. General characteristics
- 2. Atmospheric gases
- 3. Atmospheric particulates
- 4. Wet deposition
- 5. Visibility

Biological

A. Historical database

- 1. Rare event records
- 2. Bibliography of resource-descriptive documents
- 3. Collection of manuscripts, old maps, photos, etc.
- 4. GIS database and related maps

B. Species

C. Populations - for selected species

D. Communities

1. Vegetation/land cover map
2. Community structure
3. Species composition of communities
4. Abiotic components

E. Ecosystems

1. Important nutrient pools
2. Decomposition
3. Biomass (living and dead)
4. Productivity
5. Energy flow

F. Integration

1. Qualitative community descriptions. (e.g. descriptions of fossils, identification of species present as fossils)
2. Landscape patterns (e.g., fragmentation, corridors)
3. Population models for species of interest
4. Quantitative descriptions
 - a. Population dynamics
 - b. Trophic relationships
 - c. Changes in species composition
 - d. Community dynamics
5. Community models
6. Nutrient cycling models
7. Ecosystem models

G. Geography

Paleontological

Parameters for paleontological resource inventory and monitoring are not suggested in NPS-75, but, the following parameters from the Biological Section are similar to inventory and monitoring needs of paleontological resources.

A. Integration

1. Qualitative community descriptions
 - a. Description of fossils
 - b. Identification of species present
2. Landscape patterns (e.g., fragmentation, corridors)
 - a. Fossil landscape patterns (i.e. river channels, ponds, overbank deposits,...)
3. Population models for species of interest
4. Quantitative descriptions
 - a. Population dynamics
 - b. Trophic relationships
 - c. Changes in species composition
 - d. Community dynamics
5. Community models (especially among microvertebrates)

The specific priority of a given task within each of these phases depends on the urgency of the information required, the cost/benefit ratio, and the natural planning sequence in which some information must be collected before the methodology for the next task can be determined.

PRESENT CONDITION OF NATURAL RESOURCES

Very little quantitative documentation of Monument resources, other than paleontological resources, has been carried out. Six major landslides have occurred within the area of the Monument since the early 1970s, causing loss of scientifically significant strata, removal of vegetation, and forming dangerous vertical cliffs on the bluffs.

Vegetation in the Monument has been mapped for GIS vegetation types, but has never been ground surveyed. The Monument is surrounded by agricultural lands, as well as small towns, residences, and other developed areas. Grazing prior to establishment of the Monument in 1988 also undoubtedly contributed to alteration of soils, loss of native grasses, and establishment of non-native plant species. Non-native plant species known to be present include Russian olive (*Elaeagnus angustifolia*), Russian thistle (*Salsola kali*), quackgrass (*Agropyron repens*), cheatgrass (*Bromus tectorum*), blue mustard (*Chorispora tenella*), tansymustard (*Descurainia sophia*), and tumble-mustard (*Sisymbrium altissimum*) and medusa head (*Taeniatherum caput-medusae*). These and other non-native species likely to be present impair the monument's native plant communities and ecosystem processes.

The Monument's Fire Management Plan is nearly complete and will provide for prescribed burning to help in restoration of native plant communities and ecosystem processes.

There is no information on whether any federally or state-listed or candidate plant or animal species occur in the Monument, nor have species that have been extirpated been identified.

HAFO is designated as a Class II area under the 1977 Clean Air Act Amendments. Ambient air quality is not monitored in Hagerman Valley. While the air quality appears to be generally high, quantitative documentation has never been done. According to the Idaho Department of Health and Welfare, Division of Environmental Quality, the Hagerman area is considered attainment for all criteria pollutants. Northern Ada County (Boise area) is the closest non-attainment area to Hagerman and is designated non-attainment for both PM₁₀ and carbon monoxide. There are eight major sources operating on a continuous basis, and one under construction, within a 100-km radius of Hagerman. There are also six other major sources that operate on a seasonal basis. None of the current or past monitoring conducted by DEQ in southern Idaho is representative of the Hagerman area. DEQ's South Central Idaho Regional Office in Twin Falls plans to begin a monitoring program in mid-1994. This new monitoring network may provide representative air quality data for Hagerman. DEQ is willing to work closely with the monument to address monitoring needs and assist in a monitoring program if it is determined to be necessary.

Actions occurring outside of the Monument can compromise the effectiveness of the NPS in meeting its legislatively mandated responsibility to conserve the integrity of resources. The potential for impact is exacerbated by the configuration of boundaries which do not follow drainage divides or other ecologically based features and, in some locations, cut across the head of drainages, excluding the headwaters. Boundary adjustments would solve this management problem.

Pesticides and fertilizers are used in the agriculture that occurs in the region. These chemicals have the potential to affect water quality in wetlands and surface and subsurface waters.

Along the shoreline of the Monument, the flow of water through the reservoir may affect water quality, water temperature, and substrate; fish and other aquatic species; waterfowl and other water-associated bird species; native and non-native riparian plants, amphibians, and other species; and, in turn, upland species.

People currently visit the Monument for a variety of activities, primarily to see fossils, which unfortunately requires a guided tour by a Park Ranger. Limited number of staff does not provide much opportunity. As an alternative, staff has developed a self-guided driving tour, a historic trail tour, and a guide for the trail system. Trail uses include hiking, mountain biking, and horseback riding, all of which incorporate enjoyment of the open space. Other on-site uses include fishing and hunting. Adjacent uses in the reservoir include boating, jet-skiing, and other lake uses. In the future, as NPS facilities are developed and the Monument becomes more widely known, the number of people who are drawn to the Monument will increase. This diverse array of visitor activities may have a variety of impacts. No monitoring of visitor impacts is currently carried out.

SUMMARY CHART, PRESENT CONDITION OF NATURAL RESOURCES

Meets, does not meet, or exceeds the recommended minimal set of natural resources information in Appendix A of NPS-75, the *Natural Resources Inventory and Monitoring Guideline*.

INVENTORY COMPONENTS	MEETS	DOES NOT MEET	EXCEEDS
Historical Database		X	
Prehistorical Database		X	
Species Information		X	
Species List		X	
Biological Surveys (Species Field Inventories)		X	
Species Distribution		X	
Fossil Species Information		X	
Species List		X	
Paleontological Surveys		X	
Species Distribution		X	
Vegetation Maps	X		
Cartographic Maps		X	
Soils Map	X		
Geology Map		X	
Water Resources Inventory		X	
Water Quality Data		X	
Air Quality Stations		X	
Air Quality Data		X	
Precip./Meteorological Data		X	

CULTURAL RESOURCE BASELINE INFORMATION

Baseline information on cultural resources, both historic and prehistoric, within the Monument is minimal for all property types. Archeological sites are known to exist, as are segments of the Oregon Trail. Systematic surveys within and outside of the Monument have generally been project specific to address compliance needs.

This document addresses through the following project statements the need for baseline surveys for prehistoric and historic resources. Ethnographic research is underway, through both consultation with neighboring tribes and contract research. An historic resource study is nearing completion to define historic contexts for the Hagerman region within which resources associated with the Monument can be identified and evaluated.

The Monument's paleontological collections are critical to its mission, providing the focus of the research and interpretive programs. Considerable staff time is required to catalog and maintain these collections to NPS standards; the proposed research center and museum (EIS, 1996) will provide facilities that will protect and interpret the collections to NPS standards.

Monument-associated groups and resources traditionally used: The Hagerman community has long taken an active interest in the preservation and interpretation of the monument's fossil resources. The local historical society is an active partner in this effort; regional educational institutions, including Boise State and the Idaho Historical Society, represent regional users and interest groups.

On-going consultations with regional Shoshone-Bannock tribes of the Fort Hall Indian Reservation and the Shoshone-Paiute Indian Tribe of the Duck Valley Reservation have confirmed their interest in the monument. Project statements address their interests in continuing to identify and protect ethnographic and archeological resources within the Monument.

PRESENT CONDITION

Significant pre-historic and historic archeological sites have been found in and near Hagerman Fossil Beds National Monument. The geological and biological diversity of the Hagerman area provided resources for early human subsistence. Human occupation may have occurred as early as 15,000 years ago, before the Bonneville Flood, with direct evidence of at least 10,000 years ago. Various sequences of cultural adaptations to changing environments have continued to occur, as have diverse patterns of living by different groups over time.

The area contains Paleo-Indian artifact remains and other traces of prehistoric and historic Native American cultures. Consultations with contemporary Native Americans indicate that in historic times Bannock, Shoshone, and Paiute peoples frequented the area, including what is now the monument. Native American neighbors consider the monument area regionally important and worthy of interpretation for its historic fishing significance and the cultural values important to the contemporary Shoshone-Bannock Tribes of the Fort Hall Reservation and the Shoshone-Paiute Tribes of the Duck Valley Reservation.

Of major historical importance is the 1840s Oregon Trail, which traverses the Monument and reflects the activities of pioneer emigrants and local Native Americans who traded with them on their way west.

The proposed research center and museum site contains historic structures and other evidence of Euro-American farming, mining and irrigation activities. The Monument contains not only artifact remnants of early 20th century ranching, but also excavation sites from the 1920s and 1930s, which are of great relevance to the history of the science of paleontology.

Pre-history and Archeological Resources

The human story in the Hagerman area was influenced by environmental changes that forced cultural adaptation (Gehr, et al. 1982), migration of other peoples into the region (Butler 1986) and innovation and cultural contact that led to new cultural developments (Meatte 1990). These different theoretical models, along with associated cultural sequences and chronologies for the prehistory of southwestern Idaho (Rudolph, Peter, and Gross 1993p NPS, Force 1994b), indicate a continuum of human occupation from about 15,000 years before the present (B.P.) to the present period in the western Snake River basin.

Archeological remains range from stone tools and projectile points and remnant or trace habitation structures and sites to past food remains and subsistence campsites. Paleo-Indian (15,000 B.P.-8000 B.P.) projectile points have been found in the region and a few have been found in the monument (NPS, Force 1994b). These artifacts are thought to be associated with a tradition of big-game hunting when the Snake River Plain teemed with large mammals that are now extinct.

Artifacts of the subsequent Archaic period (8000 B.P.-1500 B.P.) have been found in the region with some projectile points coming from the monument. The Archaic period is characterized by "small foraging groups exploiting the modern flora and fauna" (NPS, Force 1994b). Good evidence exists of human occupation within what is now the monument during the Late Archaic period, which sets the stage for the Historic period. Indigenous peoples of the Historic period at the time of European contact maintained subsistence practices similar to the previous Archaic tradition, with mobile bands practicing a mixed hunting, fishing, and gathering economy that was relatively stable over a long period of time.

Along the Snake River, pursuing anadromous fish was a leading means of subsistence at such places as Upper and Lower Salmon Falls near the monument. The sheltered nature of the Hagerman Valley and the salmon and trout runs that penetrated up the Snake River to Upper Salmon Falls made the area very desirable for fishing. The east bank of the river, where the town of Hagerman sits, contains many fishing and camping sites, artifacts, and occupations ranging from the Paleo-Indian period through the Archaic to the Proto-Historic period. This reflects a rich history of aboriginal use and of significant cultural development in the immediate area.

"Publications on eight campsites form the core of regional archaeology in southwestern Idaho" (NPS, Force 1994b). These generally are prehistoric sites situated along streams or waterways involving rockshelters or caves in terrain similar to the Snake River going through what is now the Monument. Sites in the Monument often reflect more temporary subsistence uses at campsites, as indicated by isolated finds of projectile points and lithic scatters. However, at least one site in the Monument may have been a major fishing site among local Indian groups who also traded there with Euro-American emigrants along the Oregon Trail. Another site has features and artifacts that may indicate a hearth or storage pit with a grinding stone and metate, which appear "to represent a campsite that focused on seed processing" (NPS, Force 1994b). When fully evaluated, other related archeological sites may reveal places of more permanent habitation.

Within the Monument, the whole river corridor has been archeologically surface surveyed (Rudolph, Peter, and Gross 1993), as have the areas being considered in this plan for possible development (NPS, Force 1994b). Although less than one-fourth of the Monument has been surveyed, a number of archeological sites have been recorded. The Hagerman Valley has a relatively high number of archeological sites indicating a significant prehistoric and historic human occupancy, with lithic scatters confirming the prehistoric camping pattern in the area. The site selected for the research center and museum also has been partially surveyed (Woods 1994) and evidence of the impact of past mining activities on the site's landscape was found.

Ethnography and Ethnographic Resources

The ethnography and ethnohistory of the Monument mainly involve the traditional lifeways and cultural history of the Native American peoples (Bannocks, Paiutes, and Shoshones) who lived in the area at the time of European contact (part of the Great Basin cultural area). Their possible traditional cultural ties to and contemporary interests in what is now the Monument indicate the importance of historic fishing and campsites. A preliminary ethnography was completed under contract by the CCSO.

Historic Resources

In historic times, exploration, the movement west, placer mining, hydroelectric development, and irrigation for agriculture shaped what is now Hagerman Fossil Beds National Monument. The first European to enter Idaho was probably Meriwether Lewis. He crossed into what is now Idaho on August 12, 1805. European contact in the Hagerman Valley occurred in November of 1811 in the person of explorer-trapper Wilson Price Hunt. Later fur trappers followed. Travel on what became the Oregon Trail began in 1841, and the Hagerman area was directly affected not only by people passing through but also by those who settled in the area. For example, ferries started "to spring up around the area to help the emigrants cross the Snake River" (NPS, Force 1994b). Ferries were an important part of the regional landscape from the 1860s through the early 1900s. One livestock ferry was operated on what is now the Monument.

"The earliest mining claim in the area was 1878, and last recorded claim was 1884" (NPS, Force 1994b). Farming began in 1879. Farmers began to settle the area in greater numbers when the Oregon Short Line of the Union Pacific Railroad came in 1882. Ira Burton Perrine (1861-1943) was instrumental in bringing the railroad. He was also important in the history of agricultural irrigation and business development in southern Idaho and filed a placer gold mining claim on April 17, 1884, on what is now known as the Bell-Gisler farm on the proposed site for the research center and museum. Perrine developed the ditch now known as the Perrine Ditch, which runs through the site. It was first used for placer mining and later for irrigation. "Local tradition holds that Chinese laborers dug the ditch, though no known written records document their work" (Bukendorf 1994, 9).

Ranchers started settling in the Hagerman Valley circa 1878. Ranching with corrals and fences continued in what is now the Monument, peaking from 1910 through the 1920s. Placer mining, farming, and ranching eventually prompted the need for a post office. Hagerman got its name in 1892 when John A. "Jack" Hess and Stanley Hegeman or Hageman (1869-1898), a pharmacist from Ohio with local ranching interests and a drugstore, applied for a post office to be named Hess. That name was already in use, according to one account, so instead it was named for Hegeman on May 6, 1892. Promptly misspelled, the town on the Snake River became Hagerman (Boone 1988, 168; Coates 1989, 19; Murphey, Peter, and Bowler 1993, 120-121).

In 1910 the Great Shoshone and Twin Falls Land and Water Power Company built a dam across the Snake River at Lower Salmon Falls. The company acquired a right-of-way through what was then the Bell farm, now known as the Bell-Gisler farm complex on the site selected for the research center and museum. The dam was part of providing hydroelectric power to nearby communities and settlements. Ira Burton Perrine was involved as the local representative of James S. and William S. Kuhn, commercial and investment bankers of Pittsburgh, Pennsylvania. (Harrington 1994a, 477-478).

In the financial panic of 1913, the industrial and financial empire of the Kuhn Brothers crumbled. "Their water interests would eventually combine with other corporations to form the Idaho Power Company. Idaho Power acquired Lower Salmon Falls Dam in 1919 and added another generator. It constructed Upper

Salmon Falls Dam in 1937" (Buckendorf 1994, 10). It turns out that Ira Burton Perrine was the virtual founder of what became the Idaho Power Company through establishment of the Great Shoshone and Twin Falls Land and Water Power Company (Shoemaker 1943, 1).

Elmer Cook, a rancher who was running cattle in what is now the Monument, showed some fossil bones to Harold T. Stearns of the United States Geological Survey in 1928. Stearns in turn passed the fossils on to James W. Gidley of the Smithsonian Institution in Washington, D.C. During the summer of 1929, the two scientists met in Idaho and excavated in the discovery area. Three tons of specimens were sent back to the Smithsonian. "The material uncovered was extraordinary in that it consisted of [fossil] horses of all ages, from yearlings to old adults of both sexes... *Equus simplicidens*, making it the earliest-known representative of the modern horse genus *Equus*...[but] more closely related to the living Grevy's Zebra in Africa than to horses" (McDonald, H.G., 1993, 323).

Additional excavations were conducted in 1930, 1931, and 1934. Gidley led the first two seasons, Norman H. Boss the 1931 season, and C. Lewis Gazin the one in 1934. "What the Smithsonian had discovered was the largest single sample ever found of an extinct species of horse. In addition to the horse, there were several other animals, including beaver, otter, mastodon, peccary, a primitive muskrat, frog, rabbit, turtle, birds, and fish. The remains of many of these animals were found not only in [the Hagerman] Horse quarry, but also in sediments of the surrounding bluffs" (McDonald, H.G., 1993).

In the 1950s and 1960s Claude W. Hibbard led a renewal of scientific interest in the fossil beds at Hagerman, with emphasis this time on "what was usually the ignored part of the fauna -- the rodents and other small animals. Hibbard and his students literally crawled over the exposures at Hagerman on their hands and knees looking for mice teeth, jaws, and bones. As in the [Smithsonian Institution] Horse quarry, the search produced a phenomenal abundance of specimens... Due to the work of Hibbard and his students and subsequent workers, more than three hundred fossil localities where small vertebrates have been collected are credited to the area now known as Hagerman Fossil Beds National Monument" (McDonald, H.G. 1993).

National Register Properties

At present nothing associated with Hagerman Fossil Beds National Monument is listed on the National Register of Historic Places. The State Historic Preservation Officer (SHPO) generally has found the archeological sites in the Monument to have insufficient information to evaluate for the potential of yielding important scientific information according to the criteria for nomination to the National Register (Force 1994b). The Bell-Gisler farm complex on the proposed research center and museum site was found to be eligible for the National Register and mitigated by agreement with the SHPO. Other sites in the Monument may also be eligible, including the Oregon Trail, and paleontological excavation sites.

CULTURAL RESOURCE DOCUMENTATION CHECKLIST

Place an X in the appropriate column. Leave columns blank if document is not required for the park. Remember that items in the first section, PLANNING DOCUMENTS, may also apply to natural resources. See NPS-28, Chapter 2 for a description of each inventory or study.

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>PLANNING DOCUMENTS</u>			
GPRA Five-year Strategy		X	
Fire Management Plan (FMP)			X
Outline of Planning Requirements (OPR)			X
General Management Plan (GMP)	1996		
Development Concept Plan (DCP)			X
Resources Management Plan (RMP)	1999		
Interpretive Prospectus (IP)	1998		
<u>SERVICEWIDE INVENTORIES, LIST, CATALOGS AND REGISTERS</u>			
Cultural Resources Bibliography (CRBIB)			X
Cultural Sites Inventory			X
List of Classified Structures (LCS)*			X

- HAFO has no LCS structures.

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>SERVICEWIDE INVENTORIES, LIST, CATALOGS AND REGISTERS (CONT.)</u>			
National Catalog of Museum Objects		On-going	
Cultural Landscapes Inventory (CLI)			X
National Register of Historic Places			X
<u>BASIC CULTURAL RESOURCE DOCUMENTS</u>			
Archeological Overview and Assessment		In-progress	
Archeological Identification Studies			X
Archeological Evaluation Studies			X
Rapid Ethnographic Assessment Procedures			
Cultural Affiliation Study			
Ethnographic Landscape Study			
Ethnographic Overview and Assessment	2000		
Ethnographic Oral Histories & Life Histories		X	
Ethnographic Program			X
Historic Resource Study		In progress	
Historical Base Map			X
Park Administrative History			X
Scope of Collection Statement	2000		

TITLE	CURRENT AND APPROVED	INCOMPLETE; NEEDS REVISION OR UPDATING	NEEDED
<u>SPECIAL RESOURCE STUDIES & PLANS</u>			
Archeological & Ethno. Collections Studies			X
Archeological Data Recovery Studies			X
Collection Management Plan			X
Collection Storage Plan			X
Collection Condition Survey			X
Cultural Landscape Report (CLR)*	1994		X
Ethnohistory			X
Exhibit Plan			X
Historic Furnishing Report			
Historic Structure Report			
Inventory & Condition Assessment Program			X
Social Impact Study			
Special History Study			X
Traditional Use Study			X
Other			

SUMMARY CHART FOR STRUCTURES

Significance		Condition				Impacts				Documentation		
	Total	Good	Fair	Poor	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National												
Contributing												
State												
Local *	(1)		(1)			(1)					(1)	
Not Significant												
Not Evaluated												
Totals												

* Bell-Gisler root cellar

SUMMARY CHART FOR ARCHEOLOGICAL SITES

Significance		Condition					Impacts				Documentation		
		Good	Fair	Poor	Destroyed	Unknown	Good	Moderate	Low	Unknown	Good	Fair	Poor
National													
State & Regional													
Local													
Not Evaluated													
Totals													

SUMMARY CHART FOR ETHNOGRAPHIC RESOURCES

Resource Types	National Register	Authority	Non-Recreational Use	Documentation Level
Sites *	E	TU	U	Fair
Structures				
Objects				
Natural Resources				
Ethnographic Landscapes				
Other				

* Bell Rapids Site

SUMMARY CHART FOR CULTURAL LANDSCAPES

Significance		Condition				Impacts				Documentation		
		Good	Fair	Poor	Unknown	Severe	Moderate	Low	Unknown	Good	Fair	Poor
National												
State & Regional												
Local *	(1)		(1)			(1)					(1)	
Not Evaluated												
Totals												

* Bell-Gisler root cellar

SUMMARY CHART FOR OBJECTS

Note: Obtain data from annual collection management Report (Form 10-94)

DOCUMENTATION Form 10-254 Submitted to National Catalog at Harpers Ferry	Archeol ogy	Ethnology NA	History NA	Archives NA	Biology	Paleontology	Geology	Totals
Registration Data Only	20							
Registration & Catalog Data								
Total Items Cataloged	28					2000		
Backlog to be Cataloged					300	500	50	
Total Collection Summary								
CONDITION The percentage of collection in the following categories:								
Excellent								
Good	90					80		
Fair	10				100	20	100	
Poor								
Unknown								

CULTURAL CONTEXT AND THEMES

The National Park Service's Thematic Framework was revised in June 1994. Under the revised framework, Hagerman Fossil Beds National Monument's cultural resources fall under two primary themes:

Peopling Places: This theme examines human population movement and change through prehistoric and historic times. Topics covered by this theme include family formation, patterns of daily life, migrations, interactions between groups, and the nature of communities. The archeological sites found within the Monument need to be examined and evaluated in terms of the information they may provide on prehistoric and historic lifeways. The Oregon Trail segments, and resources associated with historic settlement, farming, mining and hydropower development are all associated with this theme.

Expanding Science and Technology: This theme focuses on science, which is modern civilization's way of organizing and conceptualizing knowledge about the world and the universe beyond. The history of paleontological investigations at Hagerman Fossil Beds and the resources, including museum collections and collection sites, associated with those investigations are significant in relation to this theme.

III. RESOURCE MANAGEMENT PROGRAMS

OVERVIEW OF CURRENT PROGRAM NEEDS

The cultural and natural resource management program is still in its early phase.

Personnel

Protection of the natural and cultural resources is the responsibility of all of the Monument's staff. The FTEs are identified in the Personnel Table produced by the Servicewide Resource Management computer program. The superintendent, who has a degree in anthropology (archeology), provides direct oversight for the Monument's resource management program. There are two administrative positions, Chief of Administration and an Automated Office Clerk.

Natural Resources are the responsibility of the Chief Ranger, Division of Resource Protection and Visitor Services. Personnel currently include a Park Ranger position, a Natural Resource Specialist, and an Education Specialist.

The park paleontologist is Chief of the Research Division, and manages the Monument's collections and has received training in NPS museum management policies.

Support for natural and cultural resources management is also provided by natural and cultural resources management specialists in the Columbia Cascades Support Office (CCSO) and the Pacific-West Region (PWR).

FUNDED PROGRAM

To-date, the resource management program has emphasized the following:

(1) Landslide projects

Following a landslide in 1991, funding was provided through Regional NRM to begin addressing this issue in FY-92. NRPP funding was secured in FY-93 to define the problem and develop a long-term solution. A three-year NRPP project was approved beginning FY94. In the first year geophysical investigations were conducted to identify subsurface water-flows, install five shallow wells (300 feet or less) to monitor water discharge sites and attempt to de-water appropriate wells, and to conduct detailed water analysis work in preparation for canal lining. Total funding was approximately \$870,000. On-site improvements should be completed FY2000.

(2) Monument planning, research center planning/design

The Research Center and Museum advanced planning was finalized in early 1994 with release of the Final Hagerman Fossil Beds National Monument Research Center and Museum Site Selection and Environmental Assessment. The Hagerman Fossil Beds National Monument General Management Plan and Environmental Impact Statement was approved in 1996. The Fire Management Plan will be completed in FY2000.

(3) Management of historical and cultural resources

The most important cultural resource priority has been to develop baseline data. Funding has been received for curatorial functions and for historical research. Specific reports produced as a result of the inventory effort will be entered into the Servicewide CRM databases and the Monument's GIS database. The Archeological and Historical Overview should be completed FY2000.

(4) Paleontological resources

Funding for fossils were received early on for preparation and curation, but funding for critically needed field preservation was not received until FY99.

(5) Biological resource management

The first funding for RMP biological management (non-native vegetation control) was received in FY2000.

Completed Projects

The following is a list of projects completed to-date and details are in the Servicewide Resource Management computer program reports section.

C-701.000	Document Historic Structures
N-001.001	Collect surface measurements/develop risk assessment
N-001.003	Study seepage of canal and storage ponds
N-001.004	Conduct cost analysis of lining canals/ponds or converting to pipe
N-102.000	Survey and map soils
N-203.001	Develop Level I water quality inventory
N-204.001	Conduct geophysical investigation of ground-water flow
N-204.002	Install new monitoring wells

Other projects have been commenced that are listed in the Accomplishments Report in the same section. These projects are in one of three categories:

- Projects that are fully funded and simply require additional time before they are completed and archived.
- Some projects remain on-going and require continuing funds classified as recurring (annual) or cyclic (periodic).
- Other projects require additional funds to be completed.

The latter two types of projects are considered unfunded.

UNFUNDED PROGRAM

There is much yet to accomplish as evident from more than 100 proposed projects that are organized by category in Table 1. Project funding is usually sought using the park's priority ranking (Table 2), but available project funds may alter the priorities. The literature listed is the support documentation followed by the reports produced in the Servicewide Resource Management computer program, including the project statements.

Table 1
CATEGORIZED LIST OF PROPOSED RESOURCE MANAGEMENT PROJECT
STATEMENTS

NATURAL RESOURCES

Paleontological Resources: 000 - 099

HAFO-N-001.000	Protect paleontological resources from loss due to landslides
N-001.002	Continue photogrammetric analysis (PMIS# 37214)
N-001.005	Abate canal leakage (PMIS# 1082)
N-001.006	De-watering of artificial perched aquifer
HAFO-N-003.000	Paleontological database management, use, and applications
HAFO-N-004.000	Survey paleontological sites and prepare base map (PMIS# 6861)
HAFO-N-005.000	Evaluate significance of fossil sites (PMIS# 36637)
HAFO-N-006.000	Develop systematic resource protection program for fossil sites (PMIS# 36608)
HAFO-N-007.000	Provide for paleontologic and geologic research
N-007.001	Develop paleontology/geology research plan
N-007.002	Implement paleontology/geology research plan
N-007.003	Study Smithsonian Horse Quarry taphonomy and depositional setting (PMIS# 36656)
HAFO-N-008.000	Correct topographic contour maps

Geologic Resources: 100 - 179

HAFO-N-100.000	Geology studies and documentation
N-100.001	Study sedimentological characterization of the Glenns Ferry Formation and map stratigraphy
N-100.002	Survey and map geology
HAFO-N-101.000	Monitor slope movement

Atmospheric/Meteorological Resources: 180 - 199

HAFO-N-180.000	Establish air quality monitoring coordination
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Hydrological Resources: 200 - 299

HAFO-N-200.000	Develop Water Resources Management Plan
HAFO-N-201.000	GIS mapping of water resources
HAFO-N-202.000	Collect and analyze surface water flow at landslides (PMIS# 36531)
HAFO-N-203.000	Analyze and document water quality
N-203.002	Monitor water quality
HAFO-N-204.000	Analysis of ground-water features and monitoring
N-204.003	Install ground-water test well (PMIS# 49957)
N-204.004	Conduct ground-water tracer tests (PMIS# 57325)
HAFO-N-205.000	Wetland documentation and management
N-205.001	Delineate wetlands

N-205.002 Wetland restoration and expansion
HAFO-N-206.000 Delineate floodplains

Biologic Resources - Flora: 300 - 399

HAFO-N-300.000 Inventory vegetation communities
HAFO-N-301.000 Document vegetative species biodiversity
HAFO-N-302.000 Manage non-native vegetation
 N-302.001 Survey and map non-native vegetation
 N-302.002 Control non-native vegetation (PMIS# 36898)
HAFO-N-303.000 Manage sensitive plant species
 N-303.001 Inventory sensitive plant species (PMIS# 30733)
 N-303.002 Monitor sensitive plant species
HAFO-N-304.000 Analyze effects of past grazing
HAFO-N-305.000 Revegetate Stable Landslide (PMIS# 37219)
HAFO-N-306.000 Develop Fire Management Program
 N-306.001 Analyze fire history and risks (PMIS#1088)
 N-306.002 Develop Fire Management Plan
 N-306.003 Maintain green strip fuel breaks (PMIS# 36777)
HAFO-N-307.000 Rehabilitate/revegetate old road and ORV trail scars

Biologic Resources - Fauna: 400 - 499

HAFO-N-400.000 Inventory and baseline studies of fauna populations
 N-400.001 Inventory and baseline studies: Waterfowl
 N-400.002 Inventory and baseline studies: Songbirds
 N-400.003 Inventory and baseline studies: Raptors
 N-400.004 Inventory and baseline studies: Mammals
 N-400.005 Inventory and baseline studies: Reptiles and amphibians (PMIS# 1089)
 N-400.006 Inventory and baseline studies: Insects / other Arthropods (PMIS# 39600)
HAFO-N-401.000 Monitor condition of fauna populations
HAFO-N-402.000 Document rare, threatened, and sensitive fauna species (PMIS# 1090)
 N-402.001 Inventory rare, threatened, and sensitive fauna species
 N-402.002 Monitor rare, threatened, and sensitive fauna species
HAFO-N-403.000 Identify extirpated fauna species (PMIS# 1091)
HAFO-N-404.000 Manage wildlife
 N-404.001 Develop Wildlife Management Plan
 N-404.002 Implement Wildlife Management

Ecosystem Processes/Systems/Linkages: 500 - 599

HAFO-N-500.000 Integrated Pest Management
 N-500.001 Develop Integrated Pest Management Plan
 N-500.002 Implement Integrated Pest Management
HAFO-N-501.000 Inventory and monitor ecosystem components
 N-501.001 Develop inventory plan for ecosystem components
 N-501.002 Implement inventory plan for ecosystem components
 N-501.003 Develop monitoring plan for ecosystem components
 N-501.004 Implement monitoring plan for ecosystem components

Human Uses: 600 – 699

HAFO-N-600.000	Inventory and monitor external activities
HAFO-N-601.000	Inventory and monitor vulnerable resources
HAFO-N-602.000	Inventory agricultural chemicals (PMIS# 36702)
HAFO-N-603.000	Evaluate poaching (PMIS# 37035)
HAFO-N-604.000	Analyze and quantify reservoir drawdown effects of Idaho Power operations (PMIS# 36721)
HAFO-N-605.000	Conduct day-use visitor survey
HAFO-N-606.000	Assess effects of visitor activities
HAFO-N-607.000	Manage visitor activities
HAFO-N-608.000	Establish protected natural area as baseline (PMIS# 1096)
HAFO-N-609.000	Adjust boundaries for protection of resources
HAFO-N-610.000	Reroute River Trail
HAFO-N-611.000	Expand Regional Trail (PMIS# 70237)

CULTURAL RESOURCES

Historic Resources: 700 - 724

HAFO-C-700.000	Inventory, evaluate and manage historic resources
C-700.001	Research and prepare historical overview
C-700.002	Preserve/document threatened historic homestead
C-700.003	Identify/document/preserve Oregon Trail ruts
HAFO-C-702.000	Establish monument archives and prepare administrative history (PMIS# 37209)

Archeological Resources: 725 - 749

HAFO-C-725.000	Inventory, evaluate and manage archeological resources (PMIS# 36917)
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Ethnographic Resources: 750 - 774

HAFO-C-750.000	Complete ethnographic studies (PMIS# 60590)
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Cultural/Historic Landscapes: 775 - 799

HAFO-C-775.000	Identify, document, evaluate, and manage cultural landscapes
C-775.001	Conduct Cultural Landscape Inventory
C-775.002	Prepare National Register nominations for cultural landscapes
C-775.003	Manage cultural landscapes

Museum Collections: 800 - 850

HAFO-I-800.000	Document museum collection
I-800.002	Prepare Collections Management Plan
I-800.003	Preparation and Cataloging Backlog of Fossils (PMIS# 59067, 59079, 59360, 59090)
I-800.004	Obtain historical documentation of past collections
I-800.005	Obtain casts of specimens located in other facilities
I-800.006	Conservation Treatment of Oregon Trail Artifacts (PMIS# 70850)
I-800.007	Reorganize Museum Collection (PMIS# 70753)
HAFO-I-801.000	Provide Center for Paleontological Research
I-801.001	Construct Research Center/Museum (PMIS# 15020)
I-801.002	Provide adequate curation facilities for paleo design and const.
I-801.003	Adaptive reuse of house to provide collection storage (PMIS# 43570)
I-801.004	Provide paleontological research services
I-801.005	Protect newly acquired lands

RESOURCES MANAGEMENT PROGRAM ADMINISTRATION and SUPPORT

Program Management: 900 - 959

HAFO-N-901.000	Implement biological resource management program
HAFO-C-902.000	Manage cultural resource program
HAFO-I-903.000	Input natural and cultural resource information into planning/design (include compliance)

Professional Development:

HAFO-N-920.000	Natural resource training and professional development
HAFO-C-921.000	Cultural resource training and professional development

Research:

HAFO-N-930.000	Administer research program
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Information Management: 960 - 999

HAFO-N-960.000	Establish natural resource database (including GIS)
HAFO-I-961.000	Develop library/library services
HAFO-I-962.000	Develop an annotated bibliography for N&C resources

Prioritized List of Proposed Resource Project Statements

- 1 N-001.000 Protect paleontological resources from loss due to landslides
 - N-001.002 Continue photogrammetric analysis
 - N-001.005 Abate canal leakage
 - N-001.006 De-watering of artificial perched aquifer
- 2 N-008.000 Correct topographic contour maps
- 3 N-004.000 Survey paleontological sites and prepare base map
- 4 N-005.000 Evaluate significance of fossil sites
- 5 N-006.000 Fossil monitoring and salvage from deterioration
- 6 N-007.000 Paleontology/geology research plan
 - N-007.001 Develop plan
 - N-007.002 Implement plan
- 7 N-307.000 Rehabilitate/revegetate old road and ORV trail scars
- 8 N-202.000 Collect and analyze surface water flow at landslides
- 9 N-101.000 Monitor slope movement
- 10 N-003.000 Paleontological database management, use, and applications
- 11 N-960.000 Establish natural resource database (includes GIS)
- 12 N-201.000 GIS mapping of water resources
- 13 N-200.000 Develop Water Resources Management Plan
- 14 N-203.000 Analyze and document water quality
 - N-203.001 Develop Level I water quality inventory
 - N-203.002 Monitor water quality
- 15 N-602.000 Monitor presence of agricultural chemicals
- 16 N-204.000 Analysis of ground-water features and monitoring
 - N-204.003 Install round-water analysis wells
 - N-204.004 Conduct ground-water tracer tests
- 17 N-100.000 Geology studies and documentation
 - N-100.001 Study sedimentological char. and map stratigraphy
 - N-100.002 Survey and map geology
- 18 N-920.000 Natural resource training / professional development
- 19 N-901.000 Manage biological resource management program
- 20 N-604.000 Determine and analyze effects of Idaho Power operations
- 21 N-930.000 Administer research program
- 22 N-501.000 Inventory and monitor ecosystem components
 - N-501.001 Develop inventory plan
 - N-501.002 Implement inventory plan
 - N-501.003 Develop monitoring plan
 - N-501.004 Implement monitoring plan
- 23 N-600.000 Inventory and monitor external activities
- 24 N-609.000 Adjust boundaries for protection of resources
- 25 N-608.000 Establish protected natural area as baseline
- 26 N-601.000 Inventory and monitor vulnerable resources
- 27 N-402.000 Document rare, threatened, and sensitive fauna species
 - N-402.001 Inventory rare, threatened, and sensitive fauna species
 - N-402.002 Monitor rare, threatened, and sensitive fauna species
- 28 N-303.000 Manage sensitive plant species
 - N-303.001 Inventory sensitive plant species
 - N-303.002 Monitor sensitive plant species

29	N-607.000	Manage visitor activities
30	N-606.000	Assess effects of visitor activities
31	N-605.000	Conduct day-use visitor survey
32	N-611.000	Expand Regional Trail
33	N-300.000	Inventory vegetation communities
34	N-302.000	Manage non-native vegetation
	N-302.001	Survey and map non-native vegetation
	N-302.002	Control non-native vegetation
35	N-305.000	Restore disturbed lands
36	N-301.000	Document Vegetative Biodiversity
	N-500.000	Integrated Pest Management
37	N-500.000	Develop Integrated Pest Management Plan
38	N-500.000	Implement Integrated Pest Management
39	N-404.000	Manage wildlife
	N-404.001	Develop Wildlife Management Plan
	N-404.002	Implement Wildlife Management
40	N-603.000	Evaluate poaching
41	N-306.000	Develop Fire Management Program
	N-306.001	Analyze fire history and risks
	N-306.002	Develop Fire Management Plan
42	N-400.000	Inventory and baseline studies of fauna populations
	N-400.001	... Waterfowl
	N-400.002	... Songbirds
	N-400.003	... Raptors
	N-400.004	... Mammals
	N-400.005	... Reptiles and Amphibians
	N-400.006	... Insects / other Arthropods
43	N-403.000	Identify fauna extirpated species
44	N-401.000	Monitor condition of fauna populations
45	N-304.000	Analyze effects of past grazing
46	N-180.000	Establish air quality monitoring coordination
47	N-205.000	Wetland documentation and management
	N-205.001	Delineate wetlands
	N-205.002	Wetland restoration and expansion
48	N-206.000	Delineate floodplains
49	N-610.000	Reroute River Trail

Prioritized List of Cultural Resource Project Statements

1	C-725.000	Inventory, evaluate and manage archaeology resources
2	C-921.000	Cultural resource training / professional development
3	C-902.000	Manage cultural resource program
4	C-700.000	Identify, evaluate and manage historic resources
	C-700.001	Research and prepare historical overview
	C-700.002	Preserve/document threatened historic homesite
	C-700.003	Identify/document/preserve Oregon Trail ruts
5	C-750.000	Document ethnographic resources
6	C-702.000	Establish monument archives and prepare administrative history

- 7 C-775.000 Identify, evaluate and manage cultural landscapes
 - C-775.001 Conduct Cultural Landscape Inventory
 - C-775.002 Prepare national register nominations for cultural landscapes
 - C-775.003 Manage cultural landscapes

Prioritized List of Integrated Project Statements

- 1 I-801.000 Preservation and storage of museum collection
 - I-801.001 Construct research center/museum
 - I-801.002 Provide adequate curation facilities for paleo – design/construct
 - I-801.003 Adaptive reuse of house to provide collection storage
 - I-801.004 Provide paleo research services
- 2 I-903.000 Input natural and cultural resource information into planning/design
- 3 I-962.000 Develop an annotated bibliography for N&C resources
- 4 I-800.000 Document museum collection
 - I-800.002 Prepare Collections Management Plan
 - I-800.003 Catalog collections
 - I-800.004 Obtain historical documentation of past collections
 - I-800.005 Obtain casts of specimens located in other facilities
 - I-800.006 Conservation Treatment of Oregon Trail Artifacts
 - I-800.007 Reorganize Museum Collection
- 5 I-961.000 Develop library/library services

SUPPORT DOCUMENTATION

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An Investigation of Nongame Bird Communities in the Hagerman Study Area, Technical Report Appendix E.3.2-A.

Habitat Characterization of Avian and Mammalian Sample Locations in the Hagerman Study Area, Technical Report Appendix E.3.2-B.

An Investigation of Upland Game Birds in the Hagerman Study Area, Technical Report Appendix E.3.2-C.

An Investigation of Cliff-Nesting Birds of Prey in the Hagerman Study Area, Technical Report Appendix E.3.2-D.

An Investigation of Wintering Waterfowl in the Hagerman Study Area, Technical Report Appendix E.3.2-E.

An Investigation of Nesting Waterfowl in the Hagerman Study Area, Technical Report Appendix E.3.2-F.

An Investigation of Colonial Waterbirds in the Hagerman Study Area, Technical Report Appendix E.3.2-G.

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REPORTS FROM SERVICEWIDE RESOURCE MANAGEMENT COMPUTER PROGRAM

All of the following information is generated from the Servicewide Resource Management computer program. The information presented as of the date of approval is current for FY00, and may be updated electronically as new information is available.

- Personnel Table
- Funded Table
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- Funded Programming Sheet 1
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- Summary Table
- List of Project Statements
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- List of Annual Accomplishments
- Annual Accomplishments Report
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Because the RMP project statement format is currently in a state of flux, the ones presented are standard as of the start of FY2000. Some have more detailed budget estimates than others because they have been upgraded for project calls. The project statements will be updated as the Servicewide computer program changes are released.